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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/935,699	08/24/2001	Toshiya Uemura	P 282892 T36-135964M/KOH	9658
21254	7590	08/23/2005	EXAMINER	
MCGINN & GIBB, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817			KORNAKOV, MICHAEL	
			ART UNIT	PAPER NUMBER
			1746	

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/935,699	Applicant(s) UEMURA ET AL.	
	Examiner Michael Kornakov	Art Unit 1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 05/31/2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-23 and 31-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-23 and 31-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 31 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. Claim 21 has been amended to recite that the semiconductor wafer has a SURFACE that comprises group III nitride compound. Previously presented claim 21 recited that the wafer per se comprised group III nitride compound.
2. Applicants' amendment has overcome rejection under 35 USC 112, second paragraph, and the rejection is, therefore, withdrawn.
3. Claims 24-30 are cancelled. New claims 33-38 are introduced.
4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 21-23, 32, 34-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Maniar et al (U.S. 5,525,542).

Maniar discloses a method for manufacturing an Aluminum nitride (AlN) semiconductor device, wherein a wafer having an aluminum nitride layer (position 20 on Fig.1) is exposed to a deep ultraviolet radiation under 300 nm, such as 248 nm (see abstract). The resist material (position 34 on Fig.4) located on the layer of aluminum nitride and is directly exposed to UV light, and therefore, the resist residue is inherently removed from Aluminum nitride layer (col.4, lines 26-45). This meets the limitations of claims 21 and 22. It is specifically noted that the instant claim 22 recites **central** wavelength of 172 nm, which is interpreted such that the whole range of UV light on both sides of 172 nm is suitable. With regard to claim 23, the excimer lamp is a limitation that is not accorded patentable weight, since it is only an apparatus for making

a process described in the prior art, and Maniar recites the wavelength as instantly claimed, therefore, the use of excimer lamp does not present a manipulative difference. Therefore, the recitation of specific limitations of apparatus for performing the step of UV irradiation does not serve to limit the claim. See, e.g., In re Otto, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963).

With regard to claim 32, Maniar discloses that after depositing AlN antireflective coating (ARC), a resist layer 22 is formed on ARC (see col.4, lines 47, 48 and Fig.2). The irradiation of resist layer deposited on AlN is performed (col.4, lines 58-64). With regard to claim 34, the exposure to UV radiation in the method of Maniar is performed under ambient conditions and therefore the oxygen molecules are inherently present at the AlN surface. With regard to claims 35, 36 see Fig. 3.

With regard to claims 37 and 38 that recite the result exposure of the surface to UV rays, the rejection is made in the sense of *Leinoff v. Louis Milona & Sons, Inc.* 220 USPQ 845 (CAFC 1984). It is axiomatic that one who performs the steps of a process must necessarily produce all of its advantages. Mere recitation of a newly discovered **function** that is inherently possessed by the things or steps in the prior art does not cause a claim drawn to those things to distinguish over the prior art. In the instant case the steps of the Maniar's process and the materials exposed in the process are substantially identical to those claimed, and therefore, the result is inherent. In the other words, the process of irradiating by UV rays of Maniar of the same surface comprising aluminum nitride and having a photoresist on it, is fully capable of producing the result as claimed.

6. Claim 31 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Maniar.

Maniar is silent about the product of oxidation of organic residues into CO, CO₂ and H₂O. However, Maniar teaches that upon exposing selected portions of resist layer 22 to radiation waves 30, these portions of the resist layer undergo **chemical changes** such as photo-acid generation which may either react with a **host polymer** via cross-linking reaction to form negative patterns or via deprotection reactions to form positive patterns. Once resist mask 34 is defined as a result of developing, device 10 is etched to transfer the resist mask pattern into underlying layers, specifically into ARC 20 and conductive layer 18 (col. 5, lines 5-20). Therefore, since the polymer is recited as a part of a resist layer it has the segments comprising "C" and "H" atoms, which under oxidation result in producing CO₂, CO and H₂). The discovery of a previously **unappreciated scientific** explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer." Atlas Powder Co. v. Ireco Inc., 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999). Thus the claiming of a new function or unknown property which is inherently present in the prior art process does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See also MPEP § 2112.01.

7. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maniar.

Maniar does not specifically disclose that semiconductor is a p-type. Being a p-type semiconductor means that it contains p-type dopant. Maniar, however, teaches

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that further tailoring of the absorption of ALN 20 can be done by altering the composition, for instance by **adding dopants** or varying the nitrogen content of the film (see col. 4, lines 44-46). Therefore, based on a suggestion of Maniar it would have been obvious to one skilled in the art to add a p-type dopant into the ALN ARC layer of Maniar in order to optimize the conductivity of the layer, and thus to arrive at the instantly claimed subject matter.

Response to Arguments

8. Applicant's arguments with respect to claims 21-23, 31-38 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael Kornakov
Primary Examiner
Art Unit 1746

08/21/2005